Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: February 4, 2003

LDC Report Date: March 27, 2003

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1444

Sample Identification

EB-4-2/4/03
MW-17-2
MW-17-3
MW-17-4
MW-17-2MS
MW-17-2MSD

Introduction

This data review covers 6 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

Instrument detection limits, interelement corrections and linear range analysis were performed at the required frequency with the following exceptions:

Analyte	Calibration	Date of Last Report	Report Frequency Requirement	Date of Analysis	Associated Samples	Flag	A or P
Perchlorate	ICAL	7/31/02	Every 6 months	2/10-2/11/03	All samples in SDG 03-1444	None	P

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-17-2MS/MSD (All samples in SDG 03-1444)	Hexavalent chromium	76 (78-115)	-	-	J (all detects) UJ (all non-detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Sample EB-4-2/4/03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-1444

SDG	Sample	Analyte	Flag	A or P	Reason
03-1444	EB-4-2/4/03 MW-17-2 MW-17-3 MW-17-4	Perchlorate	None	P	Calibration
03-1444	EB-4-2/4/03 MW-17-2 MW-17-3 MW-17-4	Hexavalent chromium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1444

No Sample Data Qualified in this SDG

D

Applied P & Ch Laboratory

Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 7196
Project ID: JPL Service ID: 31444 Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1444-1	EB-4-2/4/03	Water	02/04/03	02/04/03	02/04/03	03W1370	mg/L	0.01	<0.01	U UJ
03-1444-2	MW-17-2	Water	02/04/03	02/04/03	02/04/03	03W1370	mg/L	0.01	<0.01	U
03-1444-3	MW-17-3	Water	02/04/03	02/04/03	02/04/03	03W1370	mg/L	0.01	<0.01	U
03-1444-4	MW-17-4	Water	02/04/03	02/04/03	02/04/03	03W1370	mg/L	0.01	<0.01	U
03W1370-MB-01	03W1370-MB-01	Water	02/04/03	02/04/03	02/04/03	03W1370	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

3/26/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0
Project ID: JPL Service ID: 31444 Collected by:

Component Name: Perchlorate
CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1444-1	EB-4-2/4/03	Water	02/04/03	02/04/03	02/11/03	03W1424	µg/L	4	<4	U
03-1444-2	MW-17-2	Water	02/04/03	02/04/03	02/10/03	03W1424	µg/L	4	3.4	B
03-1444-3	MW-17-3	Water	02/04/03	02/04/03	02/11/03	03W1424	µg/L	8	145	
03-1444-4	MW-17-4	Water	02/04/03	02/04/03	02/10/03	03W1424	µg/L	4	<4	U
03W1424-MB-01	03W1424-MB-01	Water	02/10/03	02/10/03	02/10/03	03W1424	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

3/28/03

LDC #: 9985D6
SDG #: 03-1444
Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3-27-03
Page: 1 of 1
Reviewer: MG
2nd Reviewer: MD

METHOD: Hexavalent chromium (EPA SW 846 Method 7196) Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-4-03
IIa.	Initial calibration	SW	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Matrix Spike/(Matrix Spike) Duplicates	SW	
IVb.	Laboratory control samples	A	LCS/LCSD
V.	Sample result verification	N	
VI.	Overall assessment of data	A	
VII.	Field duplicates	N	
VIII.	Field blanks	ND	EB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	EB-4-2/4/03 W	11		21		31	
2	MW-17-2	12		22		32	
3	MW-17-3	13		23		33	
4	MW-17-4	14		24		34	
5	MW-17-2MS	15		25		35	
6	MW-17-2MSD	16		26		36	
7	PBW	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 9985D6
SDG #: 03-1444

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MW

All circled methods are applicable to each sample.

Sample ID	Parameter
1→4	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC (CR^{6+}) (ClO_4) ____ ____ ____
QC 5,6	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC (CR^{6+}) (ClO_4) ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}

Comments:______________________________

LDC #: 9985D6
SDG #: 03-1444

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: MG
2nd Reviewer: MB

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
(Y) N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% ?
(Y) N N/A Are all correlation coefficients $\geq$0.995 ?

LEVEL IV/D ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	7-31-02	ICAL	ClO4	ICAL > 6 mo. old (samples analyzed: 2-10→2-11-03)	all	None / P

Comments:

LDC #: 9985D6
SDG #: 03-1444

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MG
2nd Reviewer: MW

METHOD: Inorganics, EPA Method see Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	5/6	water	Cr VI	76 (78-115)			all	J/UJ/A

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: February 5, 2003

LDC Report Date: March 27, 2003

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1457

Sample Identification

EB-5-2/5/03
MW-18-2
MW-18-3
MW-18-4
MW-18-5
EB-5-2/5/03MS
EB-5-2/5/03MSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

Instrument detection limits, interelement corrections and linear range analysis were performed at the required frequency with the following exceptions:

Analyte	Calibration	Date of Last Report	Report Frequency Requirement	Date of Analysis	Associated Samples	Flag	A or P
Perchlorate	ICAL	7/31/02	Every 6 months	2/10/03	All samples in SDG 03-1457	None	P

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Sample EB-5-2/5/03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-1457

SDG	Sample	Analyte	Flag	A or P	Reason
03-1457	EB-5-2/5/03 MW-18-2 MW-18-3 MW-18-4 MW-18-5	Perchlorate	None	P	Calibration

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1457

No Sample Data Qualified in this SDG

E

Applied P & Ch Laboratory

Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 7196
Project ID: JPL Service ID: 31457 Collected by:

Component Name: Chromium (VI)
CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1457-1	EB-5-2/5/03	Water	02/05/03	02/05/03	02/05/03	03W1379	mg/L	0.01	<0.01	U
03-1457-2	MW-18-2	Water	02/05/03	02/05/03	02/05/03	03W1379	mg/L	0.01	<0.01	U
03-1457-3	MW-18-3	Water	02/05/03	02/05/03	02/05/03	03W1379	mg/L	0.01	<0.01	U
03-1457-4	MW-18-4	Water	02/05/03	02/05/03	02/05/03	03W1379	mg/L	0.01	<0.01	U
03-1457-5	MW-18-5	Water	02/05/03	02/05/03	02/05/03	03W1379	mg/L	0.01	<0.01	U
03W1379-MB-01	03W1379-MB-01	Water	02/05/03	02/05/03	02/05/03	03W1379	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.
Qualifier: U - Not Detected or less than MDL
B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

3/26/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0

Project ID: JPL Service ID: 31457 Collected by:

Component Name: Perchlorate

CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1457-1	EB-5-2/5/03	Water	02/05/03	02/05/03	02/10/03	03W1424	µg/L	4	<4	U
03-1457-2	MW-18-2	Water	02/05/03	02/05/03	02/10/03	03W1424	µg/L	4	<4	U
03-1457-3	MW-18-3	Water	02/05/03	02/05/03	02/10/03	03W1424	µg/L	4	<4	U
03-1457-4	MW-18-4	Water	02/05/03	02/05/03	02/10/03	03W1424	µg/L	4	24.6	
03-1457-5	MW-18-5	Water	02/05/03	02/05/03	02/10/03	03W1424	µg/L	4	<4	U
03W1424-MB-01	03W1424-MB-01	Water	02/10/03	02/10/03	02/10/03	03W1424	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

3/7/03

LDC #: 9985E6
SDG #: 03-1457
Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3-27-03
Page: 1 of 1
Reviewer: MG
2nd Reviewer: MW

METHOD: Hexavalent chromium (EPA SW 846 Method 7196) Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-5-03
IIa.	Initial calibration	SW	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Matrix Spike/(Matrix Spike) Duplicates	A	MW-4-1 MS/MSD (SDG: 03-1501)
IVb.	Laboratory control samples	A	LCS/LCSD
V.	Sample result verification	N	
VI.	Overall assessment of data	A	
VII.	Field duplicates	N	
VIII.	Field blanks	ND	EB=1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1 W	EB-5-2/5/03	11		21		31	
2 W	MW-18-2	12		22		32	
3 W	MW-18-3	13		23		33	
4 W	MW-18-4	14		24		34	
5 W	MW-18-5	15		25		35	
6 W	EB-5-2/5/03MS	16		26		36	
7 W	EB-5-2/5/03MSD	17		27		37	
8 W	PBW	18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 9985E6
SDG #: 03-1457

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MV

All circled methods are applicable to each sample.

Sample ID	Parameter
1→5	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC (CR^{6+}) (ClO4) ____ ____ ____
QC MS 6,7	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC (CR^{6+}) ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____

Comments: _____

LDC #: 9985E6
SDG #: 03-1457

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: MG
2nd Reviewer: MB

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
(Y) N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% ?
(Y) N N/A Are all correlation coefficients ≥0.995 ?

LEVEL IV/D ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	7-31-02	ICAL	ClO4	ICAL > 6 mo. old	all	None /P
				(samples analyzed: 2-10-03)		

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: February 6, 2003

LDC Report Date: March 27, 2003

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Applied P & Ch Laboratory

Sample Delivery Group (SDG): 03-1501

Sample Identification

EB-6-2/6/03
MW-4-1
MW-4-2
MW-4-3
MW-3-2
MW-3-3
MW-3-4
MW-4-1MS
MW-4-1MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

Instrument detection limits, interelement corrections and linear range analysis were performed at the required frequency with the following exceptions:

Analyte	Calibration	Date of Last Report	Report Frequency Requirement	Date of Analysis	Associated Samples	Flag	A or P
Perchlorate	ICAL	7/31/02	Every 6 months	2/10/03	All samples in SDG 03-1501	None	P

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Sample EB-6-2/6/03 was identified as an equipment blank. No contaminant concentrations were found in this blank.

NASA JPL
Wet Chemistry - Data Qualification Summary - SDG 03-1501

SDG	Sample	Analyte	Flag	A or P	Reason
03-1501	EB-6-2/6/03 MW-4-1 MW-4-2 MW-4-3 MW-3-2 MW-3-3 MW-3-4	Perchlorate	None	P	Calibration

NASA JPL
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 03-1501

No Sample Data Qualified in this SDG

F

Applied P & Ch Laboratory

Wet Analysis Results for Method 7196

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 7196

Project ID: JPL Service ID: 31501 Collected by:

Component Name: Chromium (VI)

CAS No: 1333-82-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1501-1	EB-6-2/6/03	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U
03-1501-2	MW-4-1	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U
03-1501-3	MW-4-2	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U
03-1501-4	MW-4-3	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U
03-1501-6	MW-3-2	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U
03-1501-7	MW-3-3	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U
03-1501-8	MW-3-4	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U
03W1392-MB-01	03W1392-MB-01	Water	02/06/03	02/06/03	02/06/03	03W1392	mg/L	0.01	<0.01	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

3/7/03

Applied P & Ch Laboratory

Wet Analysis Results for Method 314.0

Client Name: GEOFON, Inc. Project No: 04-4428.10 Anal. Method 314.0

Project ID: JPL Service ID: 31501 Collected by:

Component Name: Perchlorate

CAS No:

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
03-1501-1	EB-6-2/6/03	Water	02/06/03	02/06/03	02/10/03	03W1424	µg/L	4	<4	U
03-1501-2	MW-4-1	Water	02/06/03	02/06/03	02/10/03	03W1424	µg/L	4	2.9	B
03-1501-3	MW-4-2	Water	02/06/03	02/06/03	02/10/03	03W1424	µg/L	4	<4	U
03-1501-4	MW-4-3	Water	02/06/03	02/06/03	02/10/03	03W1424	µg/L	4	<4	U
03-1501-6	MW-3-2	Water	02/06/03	02/06/03	02/10/03	03W1424	µg/L	4	<4	U
03-1501-7	MW-3-3	Water	02/06/03	02/06/03	02/10/03	03W1424	µg/L	4	<4	U
03-1501-8	MW-3-4	Water	02/06/03	02/06/03	02/10/03	03W1424	µg/L	4	<4	U
03W1424-MB-01	03W1424-MB-01	Water	02/10/03	02/10/03	02/10/03	03W1424	µg/L	4	<4	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

3/7/03

LDC #: 9985F6
SDG #: 03-1501
Laboratory: Applied P & Ch Laboratory

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3-27-03
Page: 1 of 1
Reviewer: MG
2nd Reviewer: MD

METHOD: Hexavalent chromium (EPA SW 846 Method 7196) Perchlorate (EPA Method 314.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-6-03
IIa.	Initial calibration	SW	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Matrix Spike/(Matrix Spike) Duplicates	A	
IVb.	Laboratory control samples	A	LCS/LCSD
V.	Sample result verification	N	
VI.	Overall assessment of data	A	
VII.	Field duplicates	N	
VIII.	Field blanks	ND	EB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1 |	EB-6-2/6/03 W	11		21		31	
2 |	MW-4-1	12		22		32	
3 |	MW-4-2	13		23		33	
4 |	MW-4-3	14		24		34	
5 |	MW-3-2	15		25		35	
6 |	MW-3-3	16		26		36	
7 |	MW-3-4	17		27		37	
8 |	MW-4-1MS	18		28		38	
9 |	MW-4-1MSD	19		29		39	
10|	PBW	20		30		40	

Notes:

LDC #: 9985F6
SDG #: 03-1501

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MV

All circled methods are applicable to each sample.

Sample ID	Parameter
1→7	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC (CR^{6+}) (ClO_4)
QC 8, 9	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC (CR^{6+}) (ClO_4)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}

Comments:

LDC #: 9985F6
SDG #: 03-1501

VALIDATION FINDINGS WORKSHEET
Calibration

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
(Y) N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% ?
(Y) N N/A Are all correlation coefficients ≥0.995 ?

LEVEL IV/D ONLY:

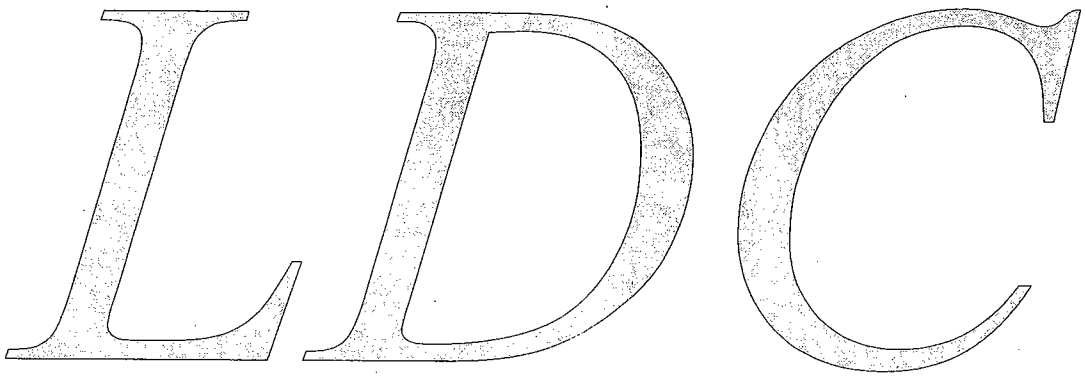
Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations.
Y N N/A Was a balance check conducted prior to the TDS analysis.?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	7-31-02	ICAL	ClO4	ICAL > 6 mo. old	all	None /P
				(samples analyzed: 2-10-03)		

Comments:

NASA JPL
Data Validation Reports
LDC# 9985

Volatiles (TO-14)



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL

Collection Date: February 18, 2003

LDC Report Date: March 20, 2003

Matrix: Air

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: Air Toxics LTD.

Sample Delivery Group (SDG): 0302376

Sample Identification

VE03-INN-017-001
VE03-EFF-017-002

Introduction

This data review covers 2 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method TO-14A for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999); the following subsections correlate to the above guidelines.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 24 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
1/22/03-2/12/03	Chloromethane	35.435	All samples in SDG 0302376	J (all detects) UJ (all non-detects)	A
	Vinyl chloride	30.158		J (all detects) UJ (all non-detects)	

Average relative response factors (RRF) for all volatile target compounds and system monitoring compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% .

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Although surrogates were not required by the method, surrogate analysis was performed by the laboratory. Surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VIII. Laboratory Control Samples (LCS)

Although laboratory control samples were not required by the method, laboratory control samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
0302376-05A-LCS/D (VE03-INN-017-001 0302376AMB)	Vinyl chloride	146 (70-130)	147 (70-130)	-	J (all detects)	P
0302376-05B-LCS/D (VE03-EFF-017-002 0302376BMB)	Vinyl chloride	142 (70-130)	142 (70-130)	-	J (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

4985A

AIR TOXICS LTD.

SAMPLE NAME: VE03-INN-017-001

ID#: 0302376-01A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s022010	Date of Collection:	2/18/03
Dil. Factor:	2.00	Date of Analysis:	2/20/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	1.0	5.0	1.0	5.2
Freon 114	1.0	7.1	Not Detected	Not Detected
Chloromethane	1.0	2.1	1.4	2.8 J
Vinyl Chloride	1.0	2.6	Not Detected	Not Detected UJ
Bromomethane	1.0	3.9	Not Detected	Not Detected
Chloroethane	1.0	2.7	Not Detected	Not Detected
Freon 11	1.0	5.7	20	110
1,1-Dichloroethene	1.0	4.0	1.9	7.6
Freon 113	1.0	7.8	6.2	48
Methylene Chloride	1.0	3.5	Not Detected	Not Detected
1,1-Dichloroethane	1.0	4.1	Not Detected	Not Detected
cis-1,2-Dichloroethene	1.0	4.0	Not Detected	Not Detected
Chloroform	1.0	5.0	10	51
1,1,1-Trichloroethane	1.0	5.5	Not Detected	Not Detected
Carbon Tetrachloride	1.0	6.4	17	110
Benzene	1.0	3.2	1.4	4.4
1,2-Dichloroethane	1.0	4.1	Not Detected	Not Detected
Trichloroethene	1.0	5.5	27	150
1,2-Dichloropropane	1.0	4.7	Not Detected	Not Detected
cis-1,3-Dichloropropene	1.0	4.6	Not Detected	Not Detected
Toluene	1.0	3.8	5.9	22
trans-1,3-Dichloropropene	1.0	4.6	Not Detected	Not Detected
1,1,2-Trichloroethane	1.0	5.5	Not Detected	Not Detected
Tetrachloroethene	1.0	6.9	2.9	20
1,2-Dibromoethane (EDB)	1.0	7.8	Not Detected	Not Detected
Chlorobenzene	1.0	4.7	Not Detected	Not Detected
Ethyl Benzene	1.0	4.4	2.3	10
m,p-Xylene	1.0	4.4	9.5	42
o-Xylene	1.0	4.4	4.0	18
Styrene	1.0	4.3	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	1.0	7.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	1.0	5.0	1.5	7.3
1,2,4-Trimethylbenzene	1.0	5.0	5.0	25
1,3-Dichlorobenzene	1.0	6.1	Not Detected	Not Detected
1,4-Dichlorobenzene	1.0	6.1	Not Detected	Not Detected
alpha-Chlorotoluene	1.0	5.3	Not Detected	Not Detected
1,2-Dichlorobenzene	1.0	6.1	Not Detected	Not Detected
1,2,4-Trichlorobenzene	4.0	30	Not Detected	Not Detected
Hexachlorobutadiene	4.0	43	Not Detected	Not Detected
Propylene	4.0	7.0	98	170
1,3-Butadiene	4.0	9.0	Not Detected	Not Detected
Acetone	4.0	9.6	260	620

0006

AIR TOXICS LTD.

SAMPLE NAME: VE03-INN-017-001

ID#: 0302376-01A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s022010	Date of Collection:	2/18/03
Dil. Factor:	2.00	Date of Analysis:	2/20/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	4.0	13	Not Detected	Not Detected
2-Propanol	4.0	10	46	120
trans-1,2-Dichloroethene	4.0	16	Not Detected	Not Detected
Vinyl Acetate	4.0	14	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.0	12	86	260
Hexane	4.0	14	Not Detected	Not Detected
Tetrahydrofuran	4.0	12	Not Detected	Not Detected
Cyclohexane	4.0	14	Not Detected	Not Detected
1,4-Dioxane	4.0	15	Not Detected	Not Detected
Bromodichloromethane	4.0	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.0	17	Not Detected	Not Detected
2-Hexanone	4.0	17	Not Detected	Not Detected
Dibromochloromethane	4.0	35	Not Detected	Not Detected
Bromoform	4.0	42	Not Detected	Not Detected
4-Ethyltoluene	4.0	20	Not Detected	Not Detected
Ethanol	4.0	7.7	31	60
Methyl tert-Butyl Ether	4.0	15	Not Detected	Not Detected
Heptane	4.0	17	5.1	21

Container Type: 1 Liter Tedlar Bag

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	92	70-130

3/24/03

0007

AIR TOXICS LTD.

SAMPLE NAME: VE03-EFF-017-002

ID#: 0302376-02A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s022109	Date of Collection:	2/18/03
Dil. Factor:	1.00	Date of Analysis:	2/21/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)	
Freon 12	0.50	2.5	1.4	7.0	
Freon 114	0.50	3.6	Not Detected	Not Detected	
Chloromethane	0.50	1.0	Not Detected	Not Detected	UJ
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected	UJ
Bromomethane	0.50	2.0	Not Detected	Not Detected	
Chloroethane	0.50	1.3	1.1	3.0	
Freon 11	0.50	2.8	11	63	
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected	
Freon 113	0.50	3.9	1.2	9.7	
Methylene Chloride	0.50	1.8	0.73	2.6	
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected	
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected	
Chloroform	0.50	2.5	Not Detected	Not Detected	
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected	
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected	
Benzene	0.50	1.6	1.6	5.3	
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected	
Trichloroethene	0.50	2.7	Not Detected	Not Detected	
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected	
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected	
Toluene	0.50	1.9	16	61	
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected	
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected	
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected	
1,2-Dibromoethane (EDB)	0.50	3.9	Not Detected	Not Detected	
Chlorobenzene	0.50	2.3	Not Detected	Not Detected	
Ethyl Benzene	0.50	2.2	4.0	18	
m,p-Xylene	0.50	2.2	17	75	
o-Xylene	0.50	2.2	6.6	29	
Styrene	0.50	2.2	Not Detected	Not Detected	
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected	
1,3,5-Trimethylbenzene	0.50	2.5	2.2	11	
1,2,4-Trimethylbenzene	0.50	2.5	6.9	34	
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected	
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected	
alpha-Chlorotoluene	0.50	2.6	Not Detected	Not Detected	
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected	
1,2,4-Trichlorobenzene	2.0	15	Not Detected	Not Detected	
Hexachlorobutadiene	2.0	22	Not Detected	Not Detected	
Propylene	2.0	3.5	Not Detected	Not Detected	
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected	
Acetone	2.0	4.8	55	130	

5-14-03 0037

AIR TOXICS LTD.

SAMPLE NAME: VE03-EFF-017-002

ID#: 0302376-02A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name: s022109	Date of Collection: 2/18/03
Dil. Factor: 1.00	Date of Analysis: 2/21/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	36	89
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	25	76
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	2.3	7.0
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	6.0	30
Ethanol	2.0	3.8	34	66
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected

Container Type: 1 Liter Tedlar Bag

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	100	70-130

3/24/03

NASA JPL
Volatiles - Data Qualification Summary - SDG 0302376

SDG	Sample	Compound	Flag	A or P	Reason
0302376	VE03-INN-017-001 VE03-EFF-017-002	Chloromethane Vinyl chloride	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
0302376	VE03-INN-017-001 VE03-EFF-017-002	Vinyl chloride	J (all detects)	P	Laboratory control samples (%R)

NASA JPL
Volatiles - Laboratory Blank Data Qualification Summary - SDG 0302376

No Sample Data Qualified in this SDG

LDC #: 9985A48
SDG #: 0302376
Laboratory: Air Toxics, Ltd.

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3-17-03
Page: 1 of 1
Reviewer: DM
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method TO-14)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-18-03
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	A~~N~~	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Air

1 1	VE03-INN-017-001	11		21		31	
2 2	VE03-EFF-017-002	12		22		32	
3 1	0302376-03A MB	13		23		33	
4 2	0302376-03B MB	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

ETHOD: VOA (EPA Method TO-14/TO-14A)

A. Chloromethane*	S. Trichloroethene	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. Benzyl chloride
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene
C. Vinyl choride**	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol
D. Chloroethane	V. Benzene	NN. Diethyl ether	FFF. 1,3-Dichlorobenzene	XXX. Ethyl ether
E. Methylene chloride	W. trans-1,3-Dichloropropene	OO. 2,2-Dichloropropane	GGG. p-Isopropyltoluene	YYY. tert-Butanol
F. Acetone	X. Bromoform*	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAAA. Ethyl tert-butyl ether
H. 1,1-Dichloroethene**	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBBB. tert-Amyl methyl ether
I. 1,1-Dichloroethane*	AA. Tetrachloroethene	SS. 1,3-Dichloropropane	KKK. 1,2,4-Trichlorobenzene	CCCC.1-Chlorohexane
J. 1,2-Dichloroethene, total	BB. 1,1,2,2-Tetrachloroethane*	TT. 1,2-Dibromoethane	LLL. Hexachlorobutadiene	DDDD. Isopropyl alcohol
K. Chloroform**	CC. Toluene**	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEEE. Acetonitrile
L. 1,2-Dichloroethane	DD. Chlorobenzene*	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFFF. Acrolein
M. 2-Butanone	EE. Ethylbenzene**	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGGG. Acrylonitrile
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropane	PPP. trans-1,2-Dichloroethene	HHHH. 1,4-Dioxane
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethene	IIII. Isobutyl alcohol
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorotoluene	RRR. m,p-Xylenes	JJJJ. Methacrylonitrile
Q. 1,2-Dichloropropane**	II. 2-Chloroethylvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKKK. Propionitrile
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLLL.

= System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 9985A48
SDG #: 0302376

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: DM
2nd Reviewer: ______

METHOD: GC/MS VOA (EPA TO-14/TO-14A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?

Y (N) N/A Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	1-22-03	ICAL	A	35.435		All + BLKS	J/UJ/A
	to		C	30.158			↓
	2-12-03						

INICAL.1A

LDC #: 998SA48
SDG #: 0302376

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: DM
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA TO-14/TO-14A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a LCS required?
Y (N) N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		0302376-05A-LCS/D	C	146 (70-130)	147 (70-130)	( )	1 + 0302376A MB	J dets / P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		0302376-05B-LCS/D	C	142 (70-130)	142 (70-130)	( )	2 + 0302376B-MB	J dets / P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		